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Ship Breaking: Environmental Health and Safety Regulatory Overview

U.S. DEPARTMENT OF THE NAVY
CARDEROCK DIVISION,
NAVAL SURFACE WARFARE CENTER

in cooperation with
National Steel and Shipbuilding Company
San Diego, California

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SHIP BREAKING: ENVIRONMENTAL AND HEALTH AND SAFETY REGULATORY OVERVIEW

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1. INTRODUCTION

When ships reach the end of their useful lives, the U.S. Government must find ways to dispose of them. Although several options exist, the most prevalent disposal option is to salvage the ships for scrap. Because ships often contain a variety of hazardous substances, ship scrapping can, if done improperly, pose dangers to human health and the environment.^{1/} Indeed, safety issues have recently risen to the forefront of a national debate concerning the United States' public policy on ship scrapping.

According to a report released by a Department of Defense ("DOD") Interagency Panel, the primary objective of the Department of the Navy's ("the Navy's") and the Maritime Administration's ("MARAD's") ship-scrapping programs has been the minimization of cost and risk to the U.S. government.^{2/} The *Interagency Report* concluded that in an effort to minimize costs, these two agencies often ignored

1/ "Ship scrapping" and "ship breaking" are used interchangeably throughout this Guide.

2/ *Report of the Interagency Panel on Ship Scrapping*, (1998) (hereinafter "*Interagency Report*"). The Office of Deputy Under Secretary of Defense for Environmental Security chaired the panel. Representatives from the Department of Justice, the Department of Navy, the Department of State, the Department of Labor, the Defense Logistics Agency, the Environmental Protection Agency, and the Department of Transportation participated on the panel.

environmental and health and safety concerns and simply awarded salvage contracts to the low-cost bidder.^{3/} As a result, several government ships have had to be repossessed due to contractor noncompliance with environmental and safety laws.^{4/} Some of these incidences, including accounts of wide-scale noncompliance by foreign breakers, have been chronicled by the news media, most notably the *Baltimore Sun*, which ran a week-long expose' on the industry in December 1997 highlighting some of the alleged dangers and industry "horror stories." As was the *Interagency Report*, these articles were highly critical of the industry, the U.S. Government's ship breaking policies, and its alleged failure to take steps necessary to eliminate and/or reduce environmental and safety noncompliance.^{5/}

In the aftermath of this recent public scrutiny, Congress enacted legislation aimed at improving the manner in which federal surplus ships are scrapped and eliminating the practice of exporting ships to unqualified foreign ship breakers. In addition, the Clinton

3/ *Id.* at 10.

4/ See, *General Accounting Office, Federal Surplus Ships: Government Efforts to Address the Growing Backlog of Ships Awaiting Disposal*, GAO/NSIAD-99-18 (October 1998) (hereinafter "*GAO Report*").

5/ *Interagency Report* at 10; Gary Cohn and Will Englund, "Scrapping Ships, Sacrificing Men," *Baltimore Sun*, December 7, 1997.

Administration temporarily restricted the circumstances under which federal ships can be exported for scrapping, the Navy and MARAD adopted several initiatives to improve their ship scrapping programs, and a DOD-led interagency panel was convened to review and recommend changes in the United States' ship breaking policies.

Chapter 2 of this Overview provides a brief background of the ship-scrapping industry as well as an overview of federal ship breaking policies, focusing in particular on the federal government's recent efforts to improve its programs and to make ship breaking more

attractive to domestic shipyards. Chapter 2 also describes the Navy's recent ship disposal pilot project that although completed will likely serve as a paradigm for future programs.

Chapters 3 and 4 provide general overviews of those environmental and health and safety laws and regulations that are likely to be triggered during ship breaking activities.

The purpose of these chapters, and this Guide generally, is to assist shipyard personnel evaluate the pros and cons of ship breaking and whether further, more detailed analyses is warranted.

2. REVIEW OF THE SHIP BREAKING INDUSTRY AND U.S. SCRAPPING POLICIES

2.1 Introduction

The Navy and MARAD own the majority of government ships available for scrapping. Historically, the Navy has scrapped its surplus ships domestically. MARAD has relied primarily on overseas scrapping.^{6/} The GAO found that from 1983 through 1994, 99 percent of MARAD's ships were scrapped at foreign ports.^{7/} Foreign ship scrapping has been favored for several reasons, foremost of which are the higher bid prices made possible by lower wages and less restrictive environmental and worker safety laws.^{8/} The average sale price of MARAD ships scrapped abroad was \$108.00, compared to \$10.00 per ton in the U.S.^{9/} In fact, domestic applicants have in some cases submitted negative bids, requiring the government to subsidize the project. The lack of interested and/or qualified domestic scrappers has also contributed to foreign scrapping.

When done incorrectly, ship scrapping can pose significant environmental and safety

risks.^{10/} Ships often contain hazardous materials and wastes, including asbestos, polychlorinated biphenyls ("PCBs"), lead, chromates, mercury, and contaminated oil, just to name a few, which if improperly managed can endanger human health and cause significant contamination and long-term harm to the environment.

The potential for mismanagement and accidents can be great for a variety of reasons. Prior to dismantling, the types and extent of hazardous wastes contained on a particular ship are often unknown, and are usually not known until they are physically encountered during the salvage operation.^{11/} Because numerous crews and/or facilities may have repaired and retrofitted the ship during its useful life, complete and accurate records of the location and types of wastes a ship may contain rarely exist.^{12/} Thus, pre-salvage identification of wastes can be difficult. Making matters worse is the fact that no two ships are identical; even ships of the same type may contain different wastes and pose different threats.^{13/} This "wait and see"

^{6/} See GAO Report at 2.

^{7/} *Id.*

^{8/} *Id.* at 6.

^{9/} Interagency Report at 8.

^{10/} GAO Report at 1 (citing Maritime Administration, U.S. Dept. of Transportation, *Environmental Assessment of the Sale of National Defense Reserve Fleet Vessels for Scrapping*, (July 1997)).

^{11/} Interagency Report at 7.

^{12/} *Id.*

^{13/} *Id.*

approach does not lend itself to environmentally-sound management practices and can jeopardize the health and safety of breaking crews, especially foreign crews that may lack the requisite hazardous wastes/substances training, skills, equipment, and appropriate disposal facilities. Finally, and in many cases, most importantly, many foreign countries do not have environmental and safety laws equivalent to those in the United States or otherwise lack the desire and/or resources to enforce the laws they do have.

The U.S. government's ship-breaking policies have been harshly criticized for allowing contracts to be awarded to companies that are unqualified to manage properly the risks associated with ship-breaking activities and/or that have violated environmental, health, and worker safety laws and standards. As mentioned above, an expose' published in the *Baltimore Sun* highlighted instances of deaths, accidents, fires, and mishandling of asbestos at both foreign and domestic ports. In particular, the *Baltimore Sun* reported on a facility in Alang, India, where ship scrapping typically is performed on beach front property, allowing toxins, oils, PCBs, asbestos, and chromates to contaminate the beach and the water, and lead fumes from burning paint to contaminate the air.^{14/} The *Baltimore Sun* also alleged that facilities in Alang are operated in a manner that endanger the health and safety of their laborers and that government enforcement of

existing safety regulations is virtually nonexistent.^{15/}

The *Baltimore Sun* series also included accounts of environmental and safety violations by domestic ship breakers. According to news reports, preventable accidents, fires, and environmental contamination occur at ship breaking facilities throughout the country.^{16/} At one such facility, workers were allegedly seen removing asbestos with their bare hands, without respirators, and dumping it into a leaky barge.^{17/} Still other articles recount stories of employee deaths, shipyard bankruptcies, and criminal convictions of ship scrappers that improperly disposed of asbestos, oil, and lead.^{18/} These alleged and, in some cases proven, instances of environmental and worker safety abuses led to contractor default, forced the Navy to repossess 20 of the 62 ships it sold for dismantling between 1991 and

^{15/} *Id.* According to the *Baltimore Sun*, none of the men who work at the Alang facility wear hard hats, safety harnesses, or respirators even though each item is required by law. See Gary Cohen and Will Englund, "A Third Dump for American's Ships?" *Baltimore Sun*, December 9, 1997. In these conditions, it is not unusual for employees to die by accident or a disease that could have been prevented. *Id.*

^{16/} See, Gary Cohn and Will Englund, "The Curious Captains of A Reckless Industry," *Baltimore Sun*, December 8, 1997.

^{17/} Gary Cohn and Will Englund, "Scrapping Ships, Sacrificing Men," *Baltimore Sun*, December 7, 1997.

^{18/} *Id.*

^{14/} Gary Cohn and Will Englund, "Mikulski Criticizes Navy Ship Breaking," *Baltimore Sun*, December 12, 1997.

1996, and significantly increased the backlog of government ships awaiting scrapping.^{19/}

The Navy and MARAD estimate a backlog of about 190 ships waiting to be dismantled.^{20/} The GAO cites four factors contributing to the backlog: (1) the Navy's downsizing; (2) the unavailability of overseas scrapping; (3) the shortage of qualified domestic bidders; and (4) the difficulties of some domestic scrappers to comply with environmental, health and safety regulations, and other contractor performance problems.^{21/}

The *GAO Report* also notes that the domestic ship breaking industry has historically been small in number, ranging from 30 firms in the 1970s to four in 1998.^{22/}

Most of these facilities are relatively small, owning less than 10 acres, thinly capitalized, and, until recently, were capable of dismantling only one ship at a time.^{23/} Other U.S. shipyards have expressed concerns about entering into the ship breaking business and those still involved have expressed doubts

^{19/} See, *GAO Report* at 6. The Navy estimates that it spent approximately \$2 million dollars to tow 14 ships back to federal storage facilities when ship breaking projects in North Carolina and Rhode Island had to be terminated due to contractor noncompliance with environmental and safety regulations. *Id.*

^{20/} Between 1991 and 1998, the number of ships scheduled to be dismantled rose from 25 to 127. *Id.*

^{21/} *Id.* at 5.

^{22/} *Id.* at 6.

^{23/} *Id.*

about their ability or willingness to continue, let alone to expand their operations under the current system.^{24/} Some ship breaking facilities have reported that expenses and liabilities associated with complying with environment and labor regulations have in the past exceeded scrapping contract fees.^{25/}

2.2 Policy Developments

2.2.1 New Federal Policy

The onslaught of negative publicity has prompted the U.S. Government to reevaluate its ship breaking policies. In particular, (1) Congress recently enacted laws restricting the exportation of ships for dismantling; (2) the Clinton Administration has temporarily limited the export of ships for breaking; (3) the Navy and MARAD have modified their contracting policies; and (4) the DOD convened an interagency panel to review U.S. scrapping programs and suggest ways to improve the scrapping process. Each of these initiatives is discussed below.

2.2.2 Congressional Action

Following the *Baltimore Sun* expose', Senator Barbara Mikulski (D-Maryland) introduced legislation, S. 2064, to prohibit the Environmental Protection Agency ("EPA") from allowing government ships to be exported for scrapping and to require the Navy to implement a pilot scrapping program to develop improved scrapping methodologies and to eliminate shipyard abuses of environmental and safety laws.

^{24/} *Id.* at 8.

^{25/} *Id.*

Senator Mikulski's bill was not enacted. However, several of its scrapping provisions were subsequently incorporated into two different appropriations bills, H.R. 4194 and 4103. The export prohibition was inserted into the Veteran's Affairs, Housing and Urban Development ("HUD") and Independent Agencies' fiscal year 1999 appropriations bill, H.R. 4194.^{26/} The legislation bars EPA for one year from allowing ships to be exported for dismantling, unless EPA can certify to Congress that the importing country has *and* enforces environmental standards comparable to those in the United States. Committee report language specifically states that the standards should be similar to those in the U.S. regarding "the removal, disposal, and abatement of

^{26/} See, Veterans Affairs & HUD Appropriations Act of 1999, Pub. L. 105-276, 112 Stat. 2461 (1998). The export measure stems from the Committee's concerns with an agreement reached between EPA, the Navy, and MARAD that essentially waived application of regulations requiring the removal of asbestos and other toxic materials before ships could be sent overseas, thereby allowing the Navy and MARAD to export ships to countries with minimal environmental standards. The Committee also was concerned that allowing government-owned ships to be exported reduced the incentives for federal agencies to scrap domestically, where costs to comply with environmental and safety standards are significantly higher. Some argued that this waiver also resulted in the potential loss of U.S. jobs and further jeopardized the stability of the domestic ship scrapping industry.

PCBs, asbestos, and other relevant hazardous materials from ships being scrapped."^{27/}

Congress also included language concerning ship scrapping in the DOD fiscal year 1999 appropriations bill, H.R. 4103. This law provided \$7.5 million for the development of a Navy ship scrapping pilot project during fiscal years 1999 and 2000.^{28/} The project is supposed to assist the Navy gather data on the cost of scrapping government-owned ships domestically and develop techniques to scrap ships in a manner that is more protective of human health and worker safety. The Navy's pilot project is discussed in detail below.

2.2.3 Executive Branch Action

On September 23, 1998, Vice President Al Gore signed an administrative memorandum prohibiting the overseas sales of Naval ships for scrapping until October 1, 1999. The directive also places a moratorium on efforts by the Navy or MARAD to award contracts or to transfer ships for scrapping overseas. Only where the two agencies are able to demonstrate either that the domestic shipping industry lacks the capacity to handle the volume of ships which need to be dismantled or that a particular nation has and enforces environmental and workplace safety laws similar to those in effect in the United States may a Naval or MARAD ship be sold and exported for scrapping.

^{27/} *Id.*

^{28/} Department of Defense Appropriations, 1999, Pub. L. 105-262, 112 Stat. 2279 (1998).

2.2.4 Efforts By the Navy and MARAD to Improve the Ship Breaking Process

The Navy and MARAD have acknowledged that existing ship scrapping practices have contributed to some of the problems encountered by domestic contractors.^{29/} The GAO agrees. The *GAO Report* cited to several aspects of each agency's scrapping program as contributing to the performance difficulties of the domestic industry:

- inadequate attention to environmental and worker safety matters;
- failure to require applicants to submit a technical plan prior to receiving a contract award; and
- failure to obtain and review a shipyard's financial and business information prior to awarding the contract, minimal contract oversight, and limited on-site progress reviews.^{30/}

In 1996, the Navy and MARAD began implementing a number of initiatives to improve their ship scrapping programs. The first change was to require bidders to submit technical plans that are used to evaluate whether applicants are indeed capable of

performing the specific contract.^{31/} The agencies also adopted a two-step bid process in an effort to improve the agencies' ability to assess whether applicants are able to scrap a ship in accordance with applicable health and safety and environmental laws.

Step One consists of a thorough evaluation of those applicants whose technical plans demonstrate the capability of handling the salvage contract. The evaluation includes an on-site inspection and an environmental, health, and safety audit. Applicants are graded on a pass/fail basis; only those that pass move on to the next step. Step Two involves a traditional financial evaluation of the applicants bid-prices.

In addition, each agency has:

- started holding post-award/pre-performance meetings with federal and state officials to discuss the contractor's plan for disposing of the ship and the environmental and safety laws applicable to ship scrapping;
- decided to have an environmental or safety specialist or an engineer conduct quarterly progress reviews at each scrapping site in order to improve contract oversight and to assess contractor compliance with applicable environmental and safety regulations; and

^{29/} See *GAO Report* at 8.

^{30/} *Id.*; see also *Interagency Report* at 13.

^{31/} *Interagency Report* at 13. The technical plan consists of an environmental compliance plan, an operational plan which describes how the ship will be dismantled, a business plan, and a health and safety plan. See Section 2.3.2.

- developed a contractor rating system to decide how closely to provide on-site contract surveillance.^{32/}

In addition to environmental considerations, the Navy and MARAD have been exploring ways to attract qualified domestic applicants into the industry by making ship scrapping more economically attractive (*i.e.*, profitable). To that end, the two agencies have decided to:

- advertise and sell ships by lot;
- allow contractors to remove ships from government storage as they are ready to be scrapped;
- hold periodic industry workshops to educate contractors on their responsibilities when scrapping federal ships and to obtain feedback from the contractors on their concerns;
- evaluate the potential for removing hazardous materials before the ships are advertised for sale; and
- notify state and local regulators that a ship will be scrapped in their jurisdiction.^{33/}

2.2.5 Interagency Ship Scrapping Panel

Other federal agencies also have examined contractor performance and environmental compliance problems

^{32/} *Id.* at 14.

^{33/} *GAO Report* at 9.

associated with ship scrapping. The DOD created an Interagency Ship Scrapping Panel to review Navy and MARAD ship scrapping programs.^{34/} The panel found that the initiatives adopted by the Navy and MARAD would help improve several of the problems identified with past contracting practices, but that additional measures should be adopted to minimize environmental and occupational hazards, and to promote the development of a domestic ship scrapping industry. To achieve these objectives, the panel recommended that the Navy and MARAD:

- conduct seminars for industry to improve industry's knowledge and understanding of the ship scrapping process;
- work with the EPA and the Occupational Safety and Health Administration ("OSHA") to develop an environmental and safety compliance manual highlighting those regulations applicable to ship scrapping activities;
- adopt contracts with enforceable provisions promoting environmental protection and occupational safety both in the U.S. and abroad;
- harmonize their contracting procedures, thereby reducing confusion among applicants and between the two programs;

^{34/} *Supra* note 2.

- adopt performance bonds to provide contractors with an incentive to develop standards for sharing contract information between federal, state, and local regulatory agencies and increasing regulatory oversight; and
- include information on the type and location of hazardous materials found on ships in the notification given to foreign countries so that the countries, in addition to individual ship-scraping facilities, have the opportunity to reject ships that may pose an extreme environmental risk.^{35/}

2.3 U. S. Navy Ship Disposal Project

As described above, Congress appropriated \$7.5 million to DOD to evaluate ways to improve the domestic shipping industry's ability to scrap ships and reduce the current backlog. The Navy spent much of 1998 developing a ship disposal pilot project designed to accomplish those goals. A draft Request for Proposal ("RFP") for the pilot project was published on November 18, 1998. Besides discussing the criteria applicants must satisfy to participate in the pilot, the draft RFP outlined the project's several purposes:

- obtain sufficient information to develop new processes and cost

^{35/} The existing export agreement between EPA, the Navy, and MARAD requires EPA to notify the governments of the importing countries whether the ship available for scrapping contains PCBs. The foreign government has 30 days following the transmission of the notice to determine whether they want the ship to be imported.

- perform as required by the contract; models for use in future decision-making;
- obtain information on all revenue and expenses associated with scrapping;
- demonstrate cost-effective technologies that facilitate compliance with environmental and safety laws; and
- document quantities and locations of hazardous wastes in Navy ships slated for scrapping.

The Navy is optimistic that participation in the pilot project will spark the interest of domestic shipyards to engage routinely in ship-breaking projects.

2.3.1 Project Award

The pilot contract was issued through a full and open competitive solicitation. The final RFP indicated that the Navy plans to award two "indefinite delivery, indefinite quantity" ("IDIQ") contracts on a "best value" basis.^{36/} In an effort to produce economies of scale and reduce the overhead costs to ship breakers, the Navy contracts will be awarded in "lots" or groups. Ships are divided between either the East coast lot or the West coast lot.

The East coast lot consists of two cruisers, nine destroyers, six frigates, seven

^{36/} "Indefinite delivery, indefinite quantity" contracts authorize contractors to furnish to the government only those services ordered by the government. *See* 48 C.F.R. § 52.216-22 (1998).

minesweepers, and one oceangoing tug, totaling approximately 75,800 tons. The West coast lot contains eight destroyers, six frigates, three minesweepers, and one diesel submarine, totaling approximately 63,000 tons. Depending on industry interest and the availability of funds, a maximum of five ships from each lot will be available for dismantling through the pilot. The first ship in each lot under the pilot project will be awarded on a "cost-plus-incentive-fee" basis.^{37/} Successful completion of the initial two IDIQ contracts will make contractors eligible to compete for the four remaining ship dismantling contracts in each lot. These remaining ships will be awarded on a "firm-fixed price" or a "fixed-price-plus-incentive" basis.^{38/}

^{37/} "Cost-plus-incentive-fee" contracts allow contractors to be reimbursed for their expenses to dismantle the ship and to obtain a fee that may be adjusted according to an adjustment formula outlined in the contract. *See* 48 C.F.R. § 16.405-1 (1998). In general, the formula provides for increases above the target fee when total allowable costs are less than the target costs and for decreases below the target fee when total costs are above the target costs. This increase and decrease in the fee is intended to provide an incentive for the contractor to manage the contract efficiently and effectively.

^{38/} Under a "fixed-price incentive" contract, offerors provide the Navy with a target cost, a maximum cost or "ceiling price," and a target profit. *See* 40 C.F.R. § 16.202-1 (1998). Halfway through the project, the contractor and the Navy will "reprice" or reassess the cost of the project to estimate the total cost to complete the contract. This "reprice" becomes a "firm-fixed price." This firm fixed price is not subject to any

The final RFP requires shipyards to demilitarize and scrap the entire ship. To "demilitarize" the ship, contractors must destroy equipment used for a military purpose. A ship is "scrapped" under the final RFP when it is destroyed such that it has "no value except for its basic material content." Contractors must scrap the hull such that "no considerable part of the ship is left intact or undisturbed to the extent that it can be reconstructed or readily identified as an existing portion of the hull or superstructure."

Contractors must also identify and remove hazardous material and wastes. To the extent that contractors handle and dispose of hazardous waste while dismantling the ship, the final RFP requires contractors to obtain waste generator identification numbers. Disposing, recycling, and selling any scrap material is also required under the RFP. Contractors are directed to apply the proceeds from the sale to offset the contractor's costs. Each of these steps must be performed in accordance with applicable federal, state, and local laws.^{39/} Thus, all permits and licenses necessary to scrap a ship must be valid at time of the contract award and remain valid throughout the contract period.

adjustments, and instead, becomes the maximum amount the contractor will receive. These types of contracts place the risk of performance and full responsibility for the costs and resulting profit or loss on the contractor.

^{39/} An overview of potentially applicable federal environmental laws is provided in Chapter 3.

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2.3.2 Proposal Submissions

To bid successfully under the pilot project contract, shipyards had to submit two types of proposals: (1) a technical plan; and (2) a financial plan.

2.3.2.1 The Technical Proposal

A shipyard's technical proposal must address three areas: (1) program and engineering management; (2) environmental and worker safety management; and (3) past performance.

2.3.2.1.1 Program and engineering management

The program and engineering management section must:

- demonstrate that the ship will be dismantled in accordance with best management practices;
- outline the measures the shipyard will take to control costs and maximize scrap sale proceeds;
- provide a schedule for completing the dismantling process;
- provide an estimated time frame for completion of the project;
- provide a detailed discussion on the procedures to be followed when scrapping the ship (*e.g.*, plans for using a dock, measures to ensure stability during hull dismantling, and measures to prevent slag or other contaminants from entering the water);

- describe how the offeror will monitor subcontractor performance;
- describe the procedures to be used to remove fuel and hydraulic oil and bilge and sump water;
- describe the facility's characteristics, including information on water depth, accessibility, capacity, and any maintenance of dredging requirements; and
- describe the offeror's workforce including a discussion of the technical experiment and training in the ship scrapping area.

2.3.2.1.2 Environmental and worker safety management

The technical proposal must include an environmental and work safety plan. The plan must address the processes and procedures they will use to identify, treat, store, and dispose of hazardous wastes encountered during the dismantling process and the measures it will take to ensure that the ship is scrapped in a safe working environment. The plan must also identify all applicable federal and state environmental and health and safety laws.

2.3.2.1.3 Past performance

Finally, shipyards are required to discuss their prior experience dismantling ships or performing other ship-related activities that make them qualified to complete the contracts awarded through the pilot. Each shipyard must submit a Reference Information Sheet ("RIS") for each contract they received within the last three years that was similar to

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ship dismantling, shipbuilding, or ship repair.

The RIS also should discuss any previous experience the shipyard has had removing and disposing of hazardous wastes.

2.3.2.2 The Cost and Pricing Proposal

The cost proposal must provide a complete summary of all costs associated with scrapping the ship, including projected overhead costs to scrap the initial ship in each lot, the costs of removing and disposing of hazardous wastes, and labor costs. All estimates must be clearly documented with a detailed description of all assumptions relied on to reach each cost estimate. For example, shipyards should discuss any assumptions that went into calculating the number of man-hours it would take to complete the project, the assumptions influencing the estimate of all indirect costs, and the assumptions influencing all estimates for the costs of materials and other overhead costs.

2.3.3 Project Status

The Navy released a final RFP in January 1999. Shipyards had 30 days from the date the final RFP was issued to submit their proposals. Approximately 90 days after receipt of the proposals, the Navy awarded the contracts.

Because the contracts were awarded just recently, it is too early to tell whether the pilot project was successful. Parties interested in following-up on the status of the Navy pilot project should contact Lieutenant Commander Melvin Jones of NAVSEA at (703) 602-7517.

Though shipyards may no longer participate in the Navy's initial ship-breaking pilot project, the U.S. Government will continue to issue contracts to scrap surplus vessels to domestic shipyards interested once the pilot project is complete and the Navy has had an opportunity to evaluate the types of hazardous material and all associated costs involved with dismantling a ship. Assuming that the pilot project is successful, then the elements discussed above should serve as a benchmark for future contracts, and interested shipyards should study them closely. Also, to gauge further the types of environmental and safety issues that may arise during ship scrapping, the reader is referred to Chapters 3 and 4 of this manual for an overview.

3. ENVIRONMENTAL LAWS AND REGULATIONS

3.1 Introduction

This Chapter provides an overview of the federal environmental and safety laws and regulations shipyards are most likely to encounter when engaging in ship breaking activities. It is intended to assist shipyards evaluate whether ship breaking is a viable and/or profitable undertaking by providing a glimpse of the numerous compliance and liability challenges associated with ship breaking activities, including regulatory requirements applicable to the disposal of such wastes as PCBs, contaminated oils, lead paint, and asbestos; the need for permits when handling, storing, treating, or disposing of a hazardous waste; and complying with national air emissions standards.

This Chapter is not, however, intended to be a comprehensive analysis of every potentially applicable regulatory requirement. Rather, it provides only a general overview of those federal requirements and policies that are most likely to affect ship breakers. There are a variety of state and local regulations that may apply to ship breaking activities. Although most state programs closely follow the federal model, states may adopt requirements that differ from (and may be more stringent than) the federal paradigm. Accordingly, applicable state laws, regulations, and policies should be consulted before undertaking any ship-breaking activities.

3.2 Legal Overview

Ship breaking can trigger requirements under any of several federal environmental

statutes, including the Comprehensive Environmental Response, Compensation and Liability Act, the Resource Conservation and Recovery Act ("RCRA"), the Clean Air Act ("CAA"), the Clean Water Act ("CWA"), and the Toxic Substances Control Act ("TSCA"). These statutes and their implementing regulations are addressed below.

3.2.1 CERCLA

Enacted by Congress in 1980, the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA," commonly known as "Superfund"), regulates the past disposal of hazardous substances and the reporting of hazardous substances that are released above certain threshold quantities. Its primary purposes are: (1) to identify contaminated areas that pose a threat to human health or the environment; (2) to provide a means to perform necessary remediation of contaminated sites; and (3) to recover the cost of cleaning up contaminated sites from those entities legally responsible for the contamination.

EPA has the authority under CERCLA to hold owners and operators of contaminated facilities and generators and transporters of hazardous substances jointly and severally liable for all costs associated with remediating a contaminated site. Thus, to the extent that ship scrappers generate, dispose of, or transport a hazardous waste to a site that eventually becomes a Superfund site, or otherwise allows their yards to become contaminated, shipyards may subject themselves to CERCLA liability.

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CERCLA also has reporting requirements that are triggered whenever a listed substance is spilled, discharged, disposed of, or otherwise released above Reportable Quantities. Obviously, this provision could also be triggered by ship scrapping activities.

3.2.1.1 Liability Triggers

A shipyard must handle a “hazardous substance” as defined under the statute to be subject to CERCLA liability. CERCLA section 101(14) defines “hazardous substance” to include:

[A]ny substance designated as hazardous or toxic under sections 307(a) and 311(b)(2)(A) of the Clean Water Act, “hazardous wastes” under the Resource Conservation and Recovery Act (with certain exceptions), hazardous air pollutants under section 112 of the Clean Air Act, imminently hazardous chemicals addressed under section 7 of the Toxic Substances Control Act.^{40/}

Also included are those substances listed in CERCLA section 102(a) which may present a “substantial danger” to public health and the environment. 42 U.S.C. § 9602(a). Natural gas and petroleum generally are excluded from this definition. Several substances commonly found aboard military vessels fall within CERCLA's all encompassing “hazardous substance” definition, including asbestos, PCBs, lead,

^{40/} 42 U.S.C. § 9601(14). A list of substances included within CERCLA's definition is located at 40 C.F.R. § 302, a copy of which is attached at Exhibit A.

paint waste, spent solvents, and contaminated bilge water.

If released, these materials could subject ship breakers to CERCLA liability in several ways. First, to the extent a spill occurs during the ship breaking process, shipyards could be liable as the current owner or operator of the contaminated area. *See id.* § 9607(a)(1). Second, ship breakers may be liable if they arrange for “treatment or disposal” of a hazardous substance. *Id.* § 9607(a)(3). Courts have interpreted this “arranger” provision broadly to cover practically any situation where there has been a relationship between two entities involving the handling and ultimate disposal of a waste containing a hazardous substance. Thus, even though ship breakers may not have generated the hazardous material found aboard a naval vessel, such facilities may qualify as persons who “arrange” for treatment or disposal of a hazardous substance and thus be potentially liable parties under CERCLA. Finally, to the extent a ship breaker selects a disposal or treatment site, transports a hazardous substance to that site, and a release occurs at the site, the ship breaker would be subject to CERCLA liability at that site. *Id.* § 9607(a)(4).

3.2.1.2 Reporting Requirements

Shipyards also may trigger liability if they fail to report any release of “hazardous substances” that exceed certain thresholds. *See id.* § 9603. The Emergency Planning Community Right to Know Act (“EPCRA”), which amended CERCLA in 1986, contains similar reporting requirements for “extremely hazardous substances.” *See* 42 U.S.C. § 11004; *see also* Section 3.2.1.2.2. Failure to report releases above the threshold quantity

(known as a "reportable quantity" ("RQ") ^{41/}) in accordance with CERCLA or EPCRA may result in civil and criminal penalties. Therefore, if there is a release while dismantling a ship, shipyards should review the reporting provisions of both CERCLA and EPCRA to determine first, if the substance released is "hazardous" or "extremely hazardous" and, second, whether the release must be reported in accordance with CERCLA and EPCRA.

3.2.1.2.1 Section 103 reporting requirements

Section 103 of CERCLA imposes reporting requirements for any release of a "hazardous substance." Specifically, under section 103(a), facilities are required to notify the National Response Center ("NRC") in Washington, D.C. (1-800-424-8802) of any unpermitted release within any 24 hour period that is equal to or greater than the RQ established for that hazardous substance. ^{42/} See 40 C.F.R. § 302.6. Facilities must notify

^{41/} A "reportable quantity" is a predesignated threshold amount for each regulated chemical substance, the release of which triggers the need for an emergency release notification report. See 40 C.F.R. § 302.4; see also Exhibit A..

^{42/} A "release" is defined to mean "any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping or disposing into the environment" that is not in compliance with a federal permit. 42 U.S.C. § 9601. The term does not apply to "continuous releases" incidental to normal operations or treatment. 40 C.F.R. § 302.8

the NRC as soon as they have knowledge that an RQ amount of a hazardous substance has been released.

EPA has established an RQ for each hazardous substance in accordance with CERCLA section 102. The RQ varies for each substance, generally ranging from one pound to 5,000 pounds. The list of CERCLA hazardous substances and their respective RQs is set forth at 40 C.F.R. section 302.4, attached hereto as Exhibit A. Where EPA has not identified an RQ for a listed substance, the RQ for that substance is one pound. See 42 U.S.C. § 9602(b).

CERCLA's notification requirements apply to:

- Hazardous substances under CERCLA section 101(14).
- Mixtures or solutions of hazardous substances whose hazardous constituents are known when the release exceeds the applicable RQ of *any hazardous constituent* in the mixture. 40 C.F.R. § 302.6(b).
- Mixtures or solutions of hazardous substances whose hazardous constituents are unknown where the total amount released equals or exceeds the RQ for the hazardous

constituent with the *lowest* RQ. *Id.* ^{43/}

Shipyards also must notify parties who may be injured by the release of a hazardous substance by publishing the notice in a local newspaper. 42 U.S.C. § 9611(g).

3.2.1.2.2 EPCRA section 304 release reporting requirements

A release of an RQ under CERCLA may also require compliance with the emergency release reporting provisions in EPCRA section 304. 42 U.S.C. § 11004. EPCRA's reporting obligations are triggered by the presence or release of a hazardous chemical in quantities equal to or greater than the RQ of any “extremely hazardous substance” or CERCLA hazardous substance. EPA's list of extremely hazardous substances and their respective RQs is listed in Appendix A of 40 C.F.R. Part 355 and is attached as Exhibit B.

Under EPCRA, facilities must immediately notify (by telephone, radio, or in person) two entities: (1) the local community emergency coordinator of any area likely to be affected by the release; and (2) the state emergency response commission of any state

^{43/} Certain types of releases are exempt from CERCLA's reporting requirements regardless of the amount released. *See* 42 U.S.C. § 9603. The following types of releases need not be reported: (1) federally permitted releases; (2) releases regulated under subtitle C of RCRA which are required to be reported (or specifically exempted from RCRA's reporting requirement); and (3) continuous releases from a facility for which notification has been given previously. *See id.* §§ 9603(a)-(f).

likely to be affected by the release. 40 C.F.R. § 355.40(b). The initial notification must include the following information:

- the chemical name or identify of the substance released;
- an indication of whether the substance is an “extremely hazardous substance”;
- an estimate of the amount released;
- the time and duration of the release;
- the medium or media (*i.e.*, soil, air, water) into which the release occurred;
- proper precautions to take in response to the release; and
- names and telephone numbers of the person(s) to be contacted for further information. *Id.*

As soon as practicable after the release, facility owners must provide a written follow-up notice updating the release information to the appropriate state and local emergency response coordinator. The follow-up written notification must include:

- an update of the information included in the initial release notification;
- information on actions taken to respond to and contain the release;
- any known or anticipated acute or chronic health risks associated with the release; and

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- where appropriate, advice regarding medical attention for exposed individuals. *Id.*

Facilities failing to comply with EPCRA's notification requirements are subject to civil penalties of up to \$27,500.00 per day for each violation. *Id.* § 355.50(a). Criminal sanctions may result if a facility knowingly and willfully violates EPCRA's notification requirements. *Id.* § 355.50(c).

3.2.1.3 CERCLA Enforcement

In the event of a “release” or a “substantial threat of a release” of a hazardous substance into the environment, CERCLA authorizes EPA (or a private party) to take certain “response” actions.^{44/} Pursuant to sections 104 and 107, EPA is authorized to remove or arrange for the removal of hazardous substances and recover its cleanup costs from the parties responsible for the release. 42 U.S.C. §§ 9604, 9607. EPA also may order the owner or operator of the shipyard at which a release occurred to cleanup the contamination under CERCLA § 106. *Id.* § 9606. Failure to comply with an EPA cleanup order could expose a shipyard to civil penalties of up to \$27,500.00 per day as well as a penalty of up to three times the cost of remediating the contaminated property.

^{44/} Although states are not authorized to administer CERCLA, many states have enacted similar remediation and cost recovery statutes. Shipyards should review all applicable state and local regulations to determine their exposure either to federal CERCLA or similar state liability.

To avoid incurring fines for failing to clean up a contaminated site, ship breakers should be vigilant about handling hazardous wastes appropriately and monitoring and remediating the release of any hazardous wastes. Ship breakers also should maintain accurate records of the source of the hazardous substance that is disposed of off-site. This will preserve any claims a shipyard may have against the Navy or MARAD for future liability in the event the shipyard is faced with CERCLA liability as a result of the ship breaking process.

3.2.2 RCRA

Subtitle C of the Resource Conservation and Recovery Act (“RCRA”) regulates “hazardous” wastes from “cradle to grave,” by imposing management requirements on:

- “generators” of hazardous waste;
- “transporters” of hazardous waste; and
- facilities that “treat, store, or dispose” hazardous waste (“TSD facilities”).

See 42 U.S.C. §§ 6921-6940.

To be regulated as a “hazardous” waste under RCRA subtitle C, a substance must first be regulated as a solid waste. RCRA defines “solid wastes” broadly as “any garbage, refuse or sludge . . . or other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial . . . operations. . . .” *Id.* § 6903(27). Thus, the statute applies potentially to any waste, even liquids and contained gases, provided the materials have been “discarded.” 40 C.F.R. § 261.3.

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A solid waste is considered “hazardous” under subtitle C if it:

- is specifically “listed” by EPA at 40 C.F.R. § 261;
- exhibits one of the four “characteristics” of hazardous waste: corrosivity, ignitability, reactivity, or toxicity (40 C.F.R. § 261.3);
- is a “mixture” of a listed waste and a solid waste, unless the mixture is specifically exempt (40 C.F.R. § 261.3(a)(2)(iv));
- is a mixture of a characteristic hazardous waste and a solid waste and the complete mixture exhibits one of the hazardous waste characteristics (40 C.F.R. § 261.3); or
- if the waste is “derived from” the treatment, storage or disposal of a hazardous waste (40 C.F.R. § 261.3(c)(2)(i)).^{45/}

Naval ships, particularly those built over 20 years ago, may contain a variety of wastes considered hazardous under RCRA. For example, ship breakers will likely encounter: (1) used oil that contains heavy metals in concentrations sufficient to make it a “listed” hazardous waste; (2) listed waste such as waste solvents; (3) lead in paint on the

^{45/} Shipyards should refer to 40 C.F.R. § 262.11 for a list of methods to be used to determine if a solid waste is a RCRA hazardous waste.

ship's hull or other structures;^{46/} and (4) “characteristic waste” such as ignitable paints or solvents, corrosive wastes (battery acid) and toxic wastes (lead paint, chromium corrosion inhibitors (coolants), etc. If some of the wastes are spilled and washed into the ballast, it too, may be required to be handled as a hazardous waste.^{47/}

To the extent a shipyard manages or disposes of a hazardous waste (e.g., wastewater containing heavy metals or solvents) during the dismantling process, ship breakers will be considered “generators” under RCRA and will have to comply with RCRA's generator requirements. If a facility ships its hazardous wastes off-site (either by the shipyard or by independent contractor), RCRA “transporter” requirements will be triggered. Ship breakers also may trigger RCRA's “treatment, storage, and disposal” requirements if a hazardous waste is treated on-site (unless the treatment is exempt from

^{46/} The hull and all other processed scrap metal from a ship to be scrapped is excluded from RCRA's subtitle C requirements, as long as the metal is treated as processed scrap metal, segregated, and sent for recycling. *See id.* § 261.4 (a)(13). Shipyards should refer to the NASSCO/NSRP guidance document entitled “Guidance For Selecting Legitimate Recycling Products and Processes” to determine if RCRA's scrap metal exemption applies.

^{47/} Shipyards also may be required to handle batteries during the ship breaking process. If so, facilities should consult 40 C.F.R. Part 273 for regulations governing the management of these “universal wastes.”

RCRA) or stored on-site for more than 90 days.

3.2.2.1 Generator Requirements

Under RCRA, a “generator” is any person whose actions or processes produce a hazardous waste or whose actions first cause a hazardous waste to become subject to regulation. 40 C.F.R. § 260.10. RCRA liability attaches to anyone who handles a substance that is a RCRA hazardous waste. Thus, if a ship breaker manages or disposes of a RCRA hazardous waste during the dismantling process, it would be subject to RCRA's generator requirements.^{48/}

The generator regulations vary, depending upon the volume of hazardous waste generated. Facilities that generate or accumulate large quantities of hazardous waste (*i.e.*, generate 2,200 pounds or more of hazardous waste per calendar month or at any time accumulate more than 2.2 pounds of acutely hazardous waste on-site) must comply with all of the generator regulations in 40 C.F.R. Part 262. These include testing and analyzing solid waste to determine if it is hazardous, obtaining an EPA generator identification number, following the manifest and pre-transport requirements if the waste will be shipped off-site, complying with the hazardous waste accumulation limits,^{49/}

^{48/} Waste that enters a shipyard facility onboard a vessel to be dismantled may also be considered as having been “generated” by the Navy or MARAD. The shipyard may, in turn, agree to perform the functions of the RCRA generator.

^{49/} Generators can accumulate hazardous waste for up to 90 days (or 180 days

following applicable land disposal restrictions for hazardous wastes, and performing a variety of recordkeeping and reporting requirements. Facilities that generate and accumulate smaller quantities of hazardous waste (*i.e.*, between 220 and 2,200 pounds of hazardous waste per calendar month or accumulate at any time more than 2,200 pounds of hazardous waste on-site) must meet the accumulation time limits, follow manifest and pre-transport requirements, and comply with recordkeeping and reporting requirements set forth in the regulations. Finally, facilities that generate less than 220 pounds of hazardous waste on-site per calendar month or accumulate up to 2,200 pounds of hazardous waste on-site are considered conditionally exempt small quantity generators and are subject to only a few of RCRA's generator requirements. These facilities need only comply with the manifest and pre-transport requirements for wastes shipped off-site, obtain an EPA generator identification number, and conduct hazardous waste determinations. *See* 40 C.F.R. §§ 261.11, 261.12, 262.20 through 262.33. Because RCRA requires generator facilities to calculate the amount of waste generated and accumulated on-site each month, facilities may be a large quantity generator one month but a small quantity generator the next. Therefore, it is important for ship breakers to assess the amount of hazardous waste generated and accumulated regularly so they know which generator requirements apply.

depending on the amount of waste generated) without obtaining a permit, provided that the waste is stored in a RCRA tank, container, or containment building. *See* 40 C.F.R. § 262.34.

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amenable for storage, or reduced in volume.

3.2.2.1 Transporter Requirements

RCRA's "transporter" provisions cover not only the commercial hazardous waste hauler, but also any person who transports hazardous waste off-site from the facility where the hazardous waste is generated. 40 C.F.R. § 260.10. Accordingly, ship breakers using their own vehicles to transport a hazardous waste from the facility where the waste is generated to another facility for treatment, storage, or disposal are subject to RCRA's transporter requirements set forth at 40 C.F.R. Part 263. These provisions contain a variety of manifesting, recordkeeping, transporting, and spill cleanup requirements and must be reviewed before a ship breaker transports waste off-site.

3.2.2.2 TSD Facilities

RCRA sections 3004 and 3005 require facilities that treat, store, and dispose of hazardous waste to comply with minimum national standards for the management of hazardous wastes and to obtain a RCRA permit prior to performing certain activities. These standards govern such things as facility design, construction, operation, maintenance, financial assurance, notification, reporting, and corrective action. *See* 40 C.F.R. Parts 264 and 265.

A facility qualifies as a "treatment facility" if it uses any method or process:

[D]esigned to change the physical, chemical, or biological character or composition of any hazardous waste so as to neutralize such waste, . . . to recover energy . . . or so as to render such waste non-hazardous, or less hazardous, safer to transport, store, or dispose of, or amenable for recovery,

Id. § 260.10.

EPA considers a facility to be a "storage facility" if it holds "hazardous waste for a temporary period, at the end of which the hazardous waste is treated, disposed, or stored elsewhere." *Id.*

A facility is considered a "disposal facility" if "hazardous waste is intentionally placed into or on any land or water, and at which waste will remain after closure." Thus, facilities where disposal is caused by an unintentional act, such as a spill, would not qualify as "disposal facilities."

Although unlikely -- and definitely avoidable -- certain ship breaking activities could transform a shipyard from a generator to a TSD. For example, a shipyard that intentionally or unintentionally stores a hazardous waste generated during the breaking process on-site for more than 90 days without an express waiver can become a RCRA "storage" facility, regardless of whether the waste ultimately is sent off site for disposal. A facility may also be deemed a TSD if it places a RCRA hazardous waste (e.g., lead paint chips) on the ground, rather than storing such wastes in RCRA tanks, containers, or containment buildings. Similarly, a shipyard that treats hazardous waste onsite could be considered a RCRA treatment facility. TSD facilities require RCRA permits and subject a facility to facility-wide corrective action.

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3.2.3 Clean Air Act

The Clean Air Act (“CAA”) establishes a national framework for the attainment and maintenance of air quality standards. Although most CAA standards likely will not be triggered by the ship breaking operation, dismantling an obsolete ship will likely subject a shipyard to CAA requirements pertaining to asbestos.^{50/} These requirements are discussed below.

3.2.3.1 Asbestos Requirements

Asbestos remediation is a primary concern during ship breaking and is subject to the CAA National Emission Standards for Hazardous Air Pollutants (“NESHAPs”) for Asbestos. *See* 40 C.F.R. Part 61, subpart M. Ship breakers will likely encounter large volumes of asbestos when cutting through several areas of the ship including bulkheads, steam, water, and vent flange gaskets, electrical cable materials, and pipe or thermal insulation.

The CAA regulations governing the demolition of structures containing asbestos

^{50/} Ship breaking also may generate air emissions of particulate matter (PM₁₀) from a variety of sources, including fumes from cutting torches, asbestos, small fires from oil ignited by cutting torches, and fugitive volatile organic compounds (“VOCs”). Though these emissions generally are not controlled through federal operating permits, nevertheless, state or local statutes may regulate these emissions.

Thus ship breakers should review state and local laws to determine if any such applicable requirements exist.

vary depending on the condition of the asbestos. “Friable” asbestos is the most heavily regulated of the asbestos-containing materials.^{51/} Non-friable asbestos is subject only to the NESHAP notification requirements.

Subpart M contains threshold amounts that determine the extent to which the regulations apply. For example, facilities handling more than 80 linear meters (260 linear feet) of pipes, 15 square meters (160 square feet) of asbestos on other components, or one cubic meter (35 cubic feet) of asbestos on facility components are subject to both the notification and the demolition requirements, whereas facilities handling less than this threshold amount must comply with the notification requirements only. *See* 40 C.F.R. §§ 61.145(a)(1)-(2). Because the amount of asbestos found on board a surplus vessel typically exceeds these thresholds, ship breakers likely will have to comply with the full panoply of requirements contained in the CAA asbestos NESHAP.

The asbestos NESHAP establishes notification requirements, standards for demolishing structures containing asbestos, and asbestos disposal standards for facilities handling friable asbestos. Prior to

^{51/} CAA regulations define “friable” as any “material containing more than 1 percent asbestos . . . that when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.” 40 C.F.R. § 61.141. Cutting, sanding, or improper removal can disrupt friable asbestos causing the asbestos fibers to be released into the air and threaten the environment and the health of shipyard employees.

demolishing or disturbing equipment aboard a ship that may contain asbestos, shipyards must provide EPA (or the appropriate state agency) with at least 10 days notice of the demolition activity. *Id.* § 61.145(b). This notification is required whenever a ship is being demolished, regardless of whether a shipyard knows if asbestos is actually present. The notice must include:

- the location of the demolition activity;
- a description of the facility including the facility's size and age, and type of asbestos to be removed;
- the methods used to detect the presence of asbestos;
- an estimate of the amount of asbestos, if any, to be removed;
- the amount of nonfriable asbestos that will remain in place during demolition;
- the scheduled dates of the demolition activity;
- certification that at least one person who has been trained appropriately will supervise the demolition; and
- the name and location of the facility where the asbestos waste will be disposed.

Id. § 61.145(b)(C)(4).

CAA regulations also establish specific standards for the demolition of structures containing friable asbestos. For example, the regulations require facilities removing asbestos to follow certain procedures (*e.g.*, adequately wet the asbestos to ensure that there are no

visible emissions,^{52/} store the removed asbestos in an appropriate leak-tight wrapping or container, and affix an appropriate warning label to any containers carrying the asbestos-containing material) prior to removing the asbestos to control asbestos emissions. Once removed, the asbestos-containing material must be contained and disposed of at an EPA-certified disposal facility. *Id.* § 61.150. At least one on-site representative, such as a foreman or management level person or other authorized representative, trained in the applicable NESHAP requirements must supervise all demolition activities. *Id.* § 61.145(c)(8).

Facilities removing non-friable asbestos are subject to fewer regulatory controls than those removing friable asbestos.

As long as the non-friable asbestos is not likely to become friable during demolition, it only has to be removed prior to demolition when the asbestos-containing material will be intentionally burned. *Id.* § 61.145(c)(10).

Also, unlike friable asbestos, nonfriable asbestos may be disposed of at any landfill that is permitted to accept demolition debris.

Nevertheless, as mentioned above, facilities removing non-friable asbestos still must comply with the regulation's notification requirements. *See id.* § 61.145(b).

Both friable and nonfriable asbestos must be shipped in marked vehicles pursuant to requirements set forth in subpart M. *See id.* §§ 61.150(c)-(d). Facilities that transport asbestos-containing material off-site must

^{52/} “Visible emissions” are defined as “any emissions which are visually detectable without the aid of instruments, coming from RACM or asbestos.” *Id.* § 61.141.

maintain shipment records that contain the following information:

- name and address of the local, state, or EPA regional office responsible for administering the NESHAP program;
- the approximate quantity shipped;
- the name, location, and telephone number of the disposal site;
- the date the asbestos-containing material is transported;
- the transporter's name; and
- a certification that the asbestos material is being shipped in accordance with the NESHAP standards. *Id.* § 61.150(d).

All records regarding asbestos shipments must be stored on-site for two years and a copy must be provided to the disposal facility at the time of delivery. *Id.*

3.2.3.1 Chlorofluorocarbons -- Removal and Disposal Requirements

CAA section 608 establishes a comprehensive program to limit the emissions of ozone-depleting chemicals (*e.g.*, chlorofluorocarbons ("CFCs")) during their use and disposal. *See* 42 U.S.C. § 7671g. In general, the regulations require parties servicing or disposing of appliances covered by the regulations (*e.g.*, refrigeration units) to observe certain service practices to minimize emissions of CFCs from those appliances. *See* 40 C.F.R. Part 82, subpart F. Although the regulations impose no direct requirements on shipyards who contract with third parties to

remove and dispose of covered appliances, this information is included for those shipyards who choose to self-service and dispose of these appliances.

Shipyards that remove refrigeration appliances from surplus vessels must comply with the regulation's recycling/removal equipment certification, technician certification, recordkeeping requirements, and the refrigeration removal, recycling, and disposal requirements. Prior to disposing of a regulated unit, shipyards must remove all refrigerant located in the covered unit to a recovery or recycling machine certified pursuant to 40 C.F.R. § 82.158. *See* 40 C.F.R. § 82.156. Open-air removal of the refrigerant is prohibited. *Id.*

Shipyards who are disposing of the appliance must have at least one piece of certified, self-contained recovery or recycling equipment available on-site. *Id.* § 82.156(b).^{53/} In addition, these facilities must have a certified technician on-site to monitor any handling of the refrigerant that is expected to release refrigerants into the atmosphere.

Shipyards disposing of "small appliances" (*e.g.*, ice makers or drinking water coolers) must ensure that all refrigerant is recovered or removed. *Id.* § 82.154(f)(1), (h). To assure compliance with the requirement

^{53/} The regulations define "self-contained recovery equipment" to mean "refrigerant recovery or recycling equipment that is capable of removing the refrigerant from an appliance without the assistance of components contained in the appliance." *Id.* § 82.152.

that refrigerant be recovered before the ultimate disposal of the appliance, facilities must file a one-time certification or registration from the entity that recovered the refrigerant before disposal. *Id.* § 82.154(f)(2). If the shipyard does not recover the refrigerant itself, it must ensure that the third party who recovers the refrigerant files the appropriate certification and that the certification is sent to the appropriate EPA regional office. *Id.* Shipyards also must comply with the recordkeeping requirements set forth in the regulations at 40 C.F.R. § 82.166.

In addition to being classified as "ozone-depleting" substances, CFCs in refrigeration equipment are considered a "hazardous substance" under CERCLA. As such, shipyards handling CFCs must comply with the CERCLA section 103 reporting requirements if a release above the RQ for CFCs occurs on-site.

3.2.4 Clean Water Act

The Clean Water Act ("CWA") governs the discharge of "pollutants" to "navigable waters." 33 U.S.C. §§ 1251-1385. Pollutants are defined as those materials listed in section 502 of the CWA such as solid waste, chemical wastes, garbage, and industrial waste. *Id.* § 1362(6). The term has been interpreted broadly to include virtually all waste material, whether or not that material has value at the time it was discharged. "Navigable waters" also has been interpreted broadly to cover nearly all waters, including wetlands. *See* 40 C.F.R. § 122.2.

To control pollutant discharges to navigable waters, the CWA uses a system of permits that contain specific discharge limitations. The CWA also sets forth reporting

and recordkeeping requirements for the accidental discharge of oil and hazardous substances above their RQs, consistent with the requirements set forth in CERCLA section 103. The CWA regulatory programs which may affect ship breakers are: (1) the National Pollutant Discharge Elimination System ("NPDES") permit program; (2) the national pretreatment program; and (3) the Spill Prevention Control and Countermeasures ("SPCC") program. Each of these programs will be discussed below.

3.2.4.1 NPDES Permits -- Direct Discharges of Pollutants

The CWA primarily relies on the NPDES permit program to control the discharge of pollutants from "point sources."^{54/}

Under the program, facilities may discharge directly into waters of the United States only if the release is made pursuant to a permit; the discharge of pollutants without a permit is prohibited.

Facilities are required to notify EPA officials about the nature and circumstances of any anticipated discharge by filing a permit application. Based on information contained in the application, officials impose limitations and conditions upon the discharge. These conditions normally include effluent limitations, requirements to minimize the discharge through treatment requirements, and to demonstrate continued compliance with those treatment requirements through

^{54/} "Point source" means any discernible, confined, or discreet conveyance including pipes, ditches, channels, and virtually any other object from which pollutants are or may be discharged. 40 C.F.R. § 122.2.

monitoring and reporting obligations. These permits are tailored to the circumstances of a particular facility and the particular point source covered by the permit. When issuing an individual NPDES permit, in addition to considering characteristics of the individual facility, permit writers consider general technology, local water quality standards, and the facility's implementation of "best management practices."

Point source discharges likely to occur during the scrapping process will include: process wastewater (bilge water, water mixed with oil, and wash waters), contact and non-contact cooling waters, and stormwater discharges associated with industrial activities. Depending on how these wastewater and stormwater discharges are managed, ship breakers may be required to obtain a NPDES permit.

NPDES permits are issued either on a site-specific, individual basis, or on a general, facility-wide basis.^{55/} Individual NPDES permits contain "effluent limitations" which restrict the amount of pollutant each point source may discharge in compliance with the law.

^{55/} Facilities must obtain approval from their permitting authority (either the state or EPA regional office) to receive a general permit. Typically general permits cover releases common to certain industries. They are published by EPA in the *Federal Register* for the nondelegated states (states with delegated authority to administer their own NPDES program publish their own list of industries qualifying for state general permits). A list of general permits can be obtained from EPA's General Permits Information Exchange ("GPIX") database at (202) 260-6057.

Ship breaking may affect currently permitted discharges by increasing or decreasing effluent flow or pollutant concentrations (*e.g.*, by adding to or changing the current level of pollutants discharged). Therefore, current NPDES permits should be reviewed carefully to determine if changes as a result of the ship breaking operation will cause permit violations. If the increased discharge cannot be made under an existing permit's limitations, ship breakers may be forced to obtain a new NPDES permit with which they can comply.

If they do not have one already, shipyards that dismantle surplus ships also may need to obtain a stormwater permit.^{56/} The CWA's stormwater requirements apply to discharges of stormwater "associated with industrial activity" through a point source either directly, or through a municipal separate storm sewer system, to waters of the United States. Basically, this covers all discharges from any point source used for collecting or conveying stormwater that is directly related to manufacturing, processing, or material storage at industrial facilities. *See id.* § 122.26.

The CWA's regulations consider all facilities within Standard Industrial Classification ("SIC") code 373 as engaged in "industrial activity" such that the CWA's permit requirements automatically apply to all areas of the shipyard from which there is runoff associated with industrial activity.

^{56/} Stormwater is defined as "stormwater runoff, snow melt runoff and surface runoff and drainage." *Id.* § 122.26(b)(13).

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Facilities must develop and implement a stormwater pollution prevention plan (“SWPPP”). Through the SWPPP, facilities must identify potential sources of stormwater pollution and evaluate their impact and develop effective controls known as best management practices (“BMPs”) to reduce the likelihood of stormwater pollution. Ship breaking may require facilities to modify their SWPPP with respect to BMPs in those areas where ship breaking is conducted. Consequently, facilities engaging in breaking activities should review their SWPPPs annually to ensure that their BMPs are working effectively.

3.2.4.2 Indirect Discharges of Pollutants -- POTW Requirements

Shipyards that discharge bilge or ballast wastewater, stormwater, or other industrial water used during the scrapping operation into local sanitary sewer systems that are treated at publicly-owned treatment works (“POTWs”) may need to obtain a pretreatment permit under section 307(b) of the CWA. *See* 33 U.S.C. § 1317. These discharges are called “indirect discharges” and are controlled primarily by the POTW. POTWs will impose pretreatment standards on industrial discharges that are likely to interfere with the POTWs ability to meet their own discharge limitations. These pretreatment standards are imposed either by permit or by contract with the industrial discharger.

If it becomes apparent that the ship-breaking operation is going to require a shipyard to discharge to a POTW or exceed an existing POTW discharge limit, the shipyard must notify the POTW prior to the discharge is allowed. This may require submission of a

baseline sampling and analysis report. *See* 40 C.F.R. § 402.12.

3.2.4.3 Spill Prevention

Ship breaking facilities also may have to comply with section 311 of the CWA which regulates the unintended discharge of oil and CWA hazardous substances listed in 40 C.F.R. § 117.3. *See* 33 U.S.C. § 1311. Similar to CERCLA's spill notification policy, section 311 requires facilities to report any accidental spill of a CWA hazardous substance or oil ^{57/} in excess of their RQs to the National Response Center (1-800-424-8802). 40 C.F.R. § 117.21. Facilities must report not only releases that take place during a particular industrial activity, but also those releases discovered that may have occurred previously.

The RQs for pollutants identified as hazardous substances under the CWA, listed at 40 C.F.R. § 117.3, range from one to 5,000 pounds as measured over a 24-hour period. *See* Exhibit C. Rather than giving a numerical RQ for oil, CWA regulations provide a narrative limit that prohibits the release of oil in quantities that would: (1) violate applicable water quality standards; or (2) cause a film or sheen upon or discoloration of the surface of the water or adjoining shorelines. *Id.* § 110.3. If a discharge of a hazardous substance or oil occurs, EPA may elect to remove the substance and assess the costs of removal against the responsible party. *Id.* § 117.23.

^{57/} The term “oil” is defined to include “oil of any kind or in any form, including, but not limited to petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil.” 40 C.F.R. § 110.2.

The CWA also requires facilities with the potential to discharge oil to navigable waters to prepare SPCC Plans. *Id.* § 112. Designed to minimize the potential for oil discharges, this requirement applies to facilities which store over 1,320 gallons of oil in aboveground tanks (or 660 gallons in one tank) or 42,000 gallons in underground tanks. SPCC Plans should be prepared in accordance with good engineering practices and should identify the methods and equipment facilities will use to prevent oil discharges. The regulations specify that a facility's SPCC Plan should include appropriate containment and/or diversionary structures to prevent discharged oil from reaching a navigable water. *Id.* § 112.7. The regulations further state that, at a minimum, facilities should use one of the following preventative systems:

Onshore facilities:

- dikes, beams, or retaining walls sufficiently impervious to contain a spill;
- curbing;
- culverting, gutters, or other drainage systems;
- weirs, booms, or other barriers;
- spill diversion ponds;
- retention ponds; and
- sorbent materials.

Offshore facilities:

- curbing, drip pans; and
- sumps and collection systems.

Id. § 112.7(c).

If it is impractical for a facility to prevent discharged oil from reaching navigable waters, the facility must develop a strong, effective oil spill contingency plan in accordance with 40 C.F.R. Part 109 or provide EPA with a written certification that the facility has the manpower and equipment to control and remove expeditiously any harmful quantity of oil discharged. *Id.* § 112.7(d). Each SPCC Plan must be reviewed and certified by a registered engineer and must be made available to EPA for on-site inspection and, if required, EPA approval. *Id.* §§ 112.3(d)-(e).

Used oil and other petroleum-based products are likely to be found aboard vessels designated for scrapping. Although most shipyards should already have a SPCC Plan in place, they may need to be modified to accommodate the breaking activities.

Shipyards should note that a significant portion of CWA enforcement is delegated to states with federally-approved programs, particularly under the NPDES permit program.^{58/} Therefore, shipyards must

^{58/} The states with delegated authority to administer water pollution control programs are: Alabama, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Jersey, New York, North Carolina, North Dakota, Ohio, NSRP 0555

review their state and local water pollution control regulations for program and permit requirements.

3.2.5 TSCA

Enacted in 1976, the Toxic Substances Control Act (“TSCA”) gives EPA complete authority to regulate the manufacture, use, distribution in commerce, and disposal of chemical substances that pose a risk to human health or the environment. *See* 15 U.S.C. §§ 2601 *et seq.* TSCA is divided into four Titles: Title I contains provisions controlling toxic substances; Title II regulates asbestos; Title III addresses radon exposure; and Title IV controls human and environmental exposure to lead-based paint. Title I, which regulates PCBs, is most relevant for ship breakers.

Ship breaking facilities may be subject to TSCA regulations if the facility handles a regulated PCB substance in quantities of 50 parts per million (“ppm”) or greater. Regulatory concerns regarding PCBs encountered during the ship breaking operation will result most often from the storage and removal of electrical equipment, such as transformers and capacitors on hydraulic equipment, electrical cable, various rubber and plastic products, insulation, aluminized paints or coatings, and waste oils.

3.2.5.1 PCB Storage and Disposal

Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virgin Islands, Virginia, Washington, West Virginia, Wisconsin, and Wyoming.

TSCA section 6(e) and its implementing regulations govern the storage and disposal of PCBs. 15 U.S.C. § 2605(e); 40 C.F.R. § 761.60. Under the regulations, facilities may store PCBs and PCB-containing materials up to one year after they are removed from use while they are awaiting disposal. 40 C.F.R. § 761.65. Facilities intending to store the PCB-containing materials for a year must satisfy the restrictive construction and leak detection requirements for storage units set forth at 40 C.F.R. § 761.65(b)(1). The regulations also impose labeling requirements for all PCB-containing materials being stored. *See id.* § 761.40(a)(10). Finally, the regulations set forth recordkeeping requirements with which facilities storing PCBs must comply. *See id.* § 761.65.

The regulations apply not only to PCBs, but also to: (1) PCB articles such as transformers and capacitors; (2) contaminated media with PCB concentrations equal to or greater than 50 ppm; and (3) media contaminated by PCBs from a source containing PCBs at concentrations equal to or greater than 50 ppm. Both accidental and intentional releases of PCBs in amounts greater than or equal to 50 ppm qualify as PCB “disposal.”

TSCA's disposal requirements vary depending on the material's PCB concentration level. To determine which requirements apply, facilities have two options: (1) measure the PCB concentration themselves; or (2) assume the concentration is 500 ppm or greater and dispose of the material under the very restrictive disposal requirements found at 40 C.F.R. § 761. Ship breakers should determine PCB concentration either through testing or relying on a

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permanent label (or other documentation) affixed on the equipment by the manufacturer or service records indicating the PCB concentration. *Id.* § 761.2(b). Shipyards choosing to sample the material to determine PCB concentration for liquids, non-liquids, mixtures or both should refer to the procedures set forth in 40 C.F.R. § 761.1(b)(4).

Generally, non-liquid PCB waste and PCB-containing materials must be disposed of in a licensed PCB incinerator or a chemical waste landfill licensed to accept PCBs. *Id.* § 761.60(b). Liquid PCBs greater than or equal to 50 ppm must be disposed of in an incinerator licensed to accept PCBs while liquid PCBs containing between 50 and 500 ppm may be disposed of in an high efficiency boiler according to 40 C.F.R. § 761.71(b). *Id.* § 761.60(a).

3.2.5.2 PCB Remediation

To the extent that PCBs are released into the environment during the dismantling process, shipyards will have to remediate all soil, gravel, sediment, or other media contaminated with PCBs in accordance with EPA's Spill Cleanup Policy ("Spill Policy") set forth at 40 C.F.R. Part 761, subpart G or with 40 C.F.R. § 761.61.

The Spill Policy governs the reporting and cleanup of all spills resulting from the release of materials containing PCBs in concentrations equal to or greater than 50 ppm. *See id.* §§ 761.120-135. The Spill Policy's cleanup standards vary, depending on the location of the PCB spills and the potential for exposure. Industrial areas, such as shipyards, are generally classified as "restricted areas" under the Policy and subject to a 25 ppm cleanup standard. All

contaminated soils resulting from cleanup of PCBs must be incinerated or disposed of at a TSCA chemical waste landfill. *Id.* § 761.125(a)(2). EPA has the discretion to vary from the Spill Policy based on certain site-specific factors.

If PCBs are released, facilities are responsible for complying with TSCA's reporting requirements. "High concentration spills" (*i.e.*, spills with a PCB concentration greater than 500 ppm or that are low concentration spills which involve more than one pound of PCBs) must be reported to the appropriate EPA regional office. In addition, steps must be taken to restrict access to the area where the spill occurred.^{59/} Spills which directly contaminate surface water, sewers, or drinking water supplies must be reported to the appropriate EPA regional office which handles the release of toxic substances. Facility owners or operators must begin cleanup measures no later than 24 hours after discovering the spill. Facilities that comply with the reporting and cleanup provisions of the Spill Policy create a presumption against

^{59/} The CWA and CERCLA also have reporting requirements for PCB releases. *See* CWA § 311 and CERCLA § 103. For example, because EPA has not developed an RQ for PCBs, spills involving one pound or more by weight of PCBs must be reported to the NRC under CERCLA. Similarly, under the CWA, all spills into the "waters of the U.S." resulting in a PCB-contaminated media of 50 ppm concentration must be reported to the NRC. 40 C.F.R. § 117.21. The reporting requirements in TSCA are designed to be consistent with those requirements in the CWA and CERCLA so as to reduce the reporting burden.

both enforcement action for penalties and the need for additional cleanup under TSCA. *See id.* § 761.135.

Shipyards also may look to 40 C.F.R. § 761.61 when determining how to respond to a release of PCBs. Under these provisions, in the event of a PCB spill, facilities may cleanup the PCB contamination through one of three options, the so-called: (1) self-implementing; (2) performance-based; and (3) risk-based.

The self-implementing option is modeled after the 1987 PCB Spill Cleanup Policy and applies to the cleanup and disposal of all PCB remediation wastes regardless of when the disposal, spill, or contamination occurred. Similar to the Spill Policy, this option requires that risk-based soil levels be achieved. However, in contrast to the Spill Policy, the self-implementing option is based on the current PCB concentration of the soil, not the concentration of the original source.

The performance-based option outlined in section 761.61(b) includes traditional disposal technologies of high-temperature incineration, high-efficiency boilers, chemical waste landfills, and alternative methodologies approved by the regional administrator.

The risk-based remediation option (section 761.61(c)) bases disposal requirements for PCB remediation waste on the "potential risk to health and the environment resulting from the residual PCBs in the PCB remediation waste." The section authorizes the regional administrator, based on a site-specific risk assessment, to approve an application for different cleanup and disposal requirements, provided that they would not

pose an unreasonable risk of injury to health or the environment.

3.2.5.3 Recordkeeping and Monitoring Requirements

Section 761.180 contains recordkeeping and reporting requirements for facilities storing (at any one time) at least 99.4 pounds of PCBs in a PCB Container, one or more PCB Transformers, or 50 or more PCB Large High or Low Voltage Capacitors. *Id.* § 761.180(b). Facilities storing PCBs for disposal are required to maintain all disposal documents (manifests and certificates of disposal) for at least three years after the facility has stopped storing PCBs. *Id.*

Facilities must use these records to develop an annual report that must be filed with EPA by July 1 and which must contain detailed information about the PCB material such as: (1) the date when PCBs and PCB items were removed from service and were placed into storage for disposal; (2) the number identifying each PCB-containing item; (3) a record of each call or other means of verification agreed upon by both parties to confirm receipt of PCB waste transported by an independent transporter; and (4) the name and address of the initial disposal or storage facility. *Id.* § 761.180(b)(2).

4. OCCUPATIONAL SAFETY AND HEALTH ACT

4.1 Introduction

The Occupational Safety and Health Administration ("OSHA"), created in 1970 with the enactment of the Occupational Safety and Health Act ("OSHAct"), 29 U.S.C. §§ 651 *et seq.*, sets occupational safety and health requirements applicable to private employers and employees. The OSHAct's regulations apply to virtually every type of private employer who is engaged in any business affecting interstate commerce, regardless of size. The OSHAct generally requires employers to do five things: (1) maintain a workplace which is free of recognized hazards likely to cause death or serious physical harm ("the general duty clause"); (2) observe and comply with occupational safety and health standards and rules that are promulgated by OSHA; (3) maintain accurate records of all work-related injuries and illnesses; (4) inform employees of their protections under the OSHAct and provide effective training on workplace hazards pursuant to various specific OSHA programs; and (5) permit the inspection of their premises by federal and state officials. *See* 29 U.S.C. §§ 651 *et seq.*

In addition to general industry standards (29 C.F.R. Part 1910), OSHA has promulgated specific standards for employers engaged in ship building, ship repairing, and ship breaking (29 C.F.R. Part 1915). These standards establish a multitude of regulatory compliance requirements and programs applicable to employers engaged in the shipbuilding industry.^{60/} Among the more significant of these are regulations governing

confined spaces (dangerous atmosphere); the use of toxic cleaning solvents and paints; welding, cutting and heating; and exposure of toxic and hazardous substances. Three of the more complex or fundamental industry-specific regulatory requirements are discussed below.

4.2 Industry-Specific Regulatory Requirements

4.2.1 Confined and Enclosed Work Places

Ship breaking employees often work in confined and enclosed areas of a ship during the dismantling operations. The regulations define "confined space" to mean a "compartment of small size and limited access, such as a blower bottom tank . . . such that it can readily create or aggravate a hazardous exposure." 29 C.F.R. § 1915.4(p) An "enclosed space" is similarly described to include a space enclosed by bulkheads and an overhead. *Id.* at § 1915.4(q) These covered spaces would include, for instance, areas such as cargo holds, pump or engine rooms, storage lockers, tanks containing flammable or combustible liquids, gases, or solids, and crawl spaces. *Id.*

Part 1910 apply directly to employers in this industry unless a more specific standard has been developed for the ship building and repair industry under 29 C.F.R. Part 1915.

^{60/} The requirements set forth at 29 C.F.R.

Confined and enclosed spaces pose special dangers to laborers because the configurations may potentially hamper efforts to prevent serious hazards such as toxic, explosive, or asphyxiating atmospheres. Because of these special dangers, OSHA requires employers to conduct visual inspections and atmospheric testing of certain categories of confined and enclosed spaces prior to allowing workers to enter the area. *Id.* § 1915.12

OSHA regulations specify the manner in which employers must inspect confined spaces for oxygen content, flammability, and toxicity. Employers must have a "competent person" ^{61/} inspect and test an area's oxygen levels to determine if the space contains a sufficient level of oxygen. *Id.* § 1915.12(a). Additionally, competent persons must inspect regulated spaces that contain or have contained flammable liquids or gases to determine the concentration of flammable vapors or gases within the area. Finally, employers must have a competent person inspect and test areas which contain or have contained toxic, combustive, or irritating substances to determine the presence and air concentration of these contaminants. *Id.*

If any of these tests reveal that the confined space poses a health risk (*e.g.*, too much or too little oxygen, the presence of flammable or toxic contaminants), employers

^{61/} A person is "competent" if they are capable of "recognizing and evaluating employee exposure to hazardous substances or to other unsafe conditions and is capable of specifying the necessary protection and precautions to be taken to ensure the safety of employees." 29 C.F.R. § 1915.4(o).

must post warning signs indicating that the area is not safe for workers. *Id.* §§ 1915.12(a), (b)(2), and (c)(2). Beyond warning signs, employers also are required to ventilate the designated areas to bring the spaces within established and delineated standards (*i.e.*, below applicable permissible exposure limit ("PEL")). Until the ventilation precautions bring the area within the delineated ranges, employees may not enter the spaces, except under certain emergency conditions. Additionally, the standard establishes employee training requirements and mandates the use of appropriate personal protective equipment ("PPE") prior to employee entrance into a regulated space. The regulations also require an employer to establish a shipyard "rescue team" or arrange for an outside team who have been trained to use respirators and other type of PPE, rescue equipment, and to rescue employees from regulated spaces. *Id.* § 1915.12(e). These teams are required to participate in practice drills at least once annually. *Id.*

4.2.2 Toxic and Hazardous Substances Exposures

OSHA also has established an air contaminants standard specifically applicable to the ship building/ship breaking industry. *See id.* § 1915.1000. The standard establishes threshold limits for chemical substances common to the industry above which employees may not be exposed. The limits include either (or both in certain instances) a ceiling limit (to be monitored instantaneously or on a 15 minute time weighted average exposure) or an eight hour time weighted average limit. While the chemicals for which exposure limits are established number in the hundreds, the two substances of particular concern to this industry are lead and asbestos.

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OSHA has promulgated a comprehensive set of requirements applicable to employers who are removing materials containing asbestos, demolishing or salvaging ships containing asbestos, or cleaning up asbestos that has leaked or spilled. *Id.* § 1915.1001. These regulations are designed to ensure that no shipyard employee is exposed to an airborne concentration of asbestos that exceeds 0.1 fiber per cubic centimeter of air.

Although the regulations vary depending on the volume and type of asbestos shipyard employees are handling, all employers generally must: (1) establish work practices and engineering controls that will minimize employee exposure to asbestos fibers; (2) provide protective clothing (*e.g.*, coveralls or other whole-body clothing, gloves, and footwear) and respirators to all employees exposed to airborne concentrations of asbestos that exceed OSHA's time weighted average limit for asbestos; (3) provide separate rooms for contaminated and street clothing and establish written hygiene practices governing employee behavior in those areas; (4) ensure that all asbestos work is performed within regulated areas and is supervised by a person trained to identify asbestos hazards in the workplace; (5) train all employees who are likely to be exposed to asbestos in excess of the PEL; and (6) affix labels to all storage units containing asbestos and post warning signs clearly communicating the hazard associated with entering the designated area without wearing the appropriate protective clothing. *See id.* §§ 1915.1001(c)-(k).

A comprehensive OSHA regulatory program has also been established for lead exposure. *See id.* § 1915.1025 (referring to the

regulations set forth at 29 C.F.R. § 1910.1025.)

The regulations require employers to monitor employee exposure to lead to ensure it does not exceed the OSHA action level of 30 micrograms per cubic meter of air ("ug/m³"). 29 C.F.R. § 1910.1025(b). If initial monitoring demonstrates employee exposure above the action level, monitoring is required every six months until the consecutive measurements demonstrate exposures have decreased below the action levels. *Id.* § 1910.1025(d)(6)(ii).

The regulations include a PEL of 50 ug/m³ averaged over an eight hour period. *Id.* at § 1910.1025(c). If exposures exceed the PEL, a comprehensive written compliance program must be established. Under the program, employers are required, among other things, to implement work practices and engineering controls to minimize employee exposure to lead, provide respirators and protective clothing to employees who are likely to be exposed to lead levels above the OSHA PEL, provide separate changing rooms for contaminated and clean clothing, and post warning signs in work areas where the PEL for lead is exceeded. *Id.* at § 1910.1025 (e).

The lead standard also requires a comprehensive medical surveillance program to be established for any employee who is "or may be" exposed to the lead action level for more than 30 days per year. *Id.* at § 1910.1025(j).

4.2.3 Personal Protective Equipment

Under the OSHAct, shipyard employers are required to provide protective equipment when the equipment is “required by the company for the worker to do his or her job safely and in compliance with OSHA standards.” *See* 29 C.F.R. § 1915.152. Similar to other employers, shipyards are required to conduct a general hazard assessment of their workplace to determine whether there are hazards requiring the use of PPE; to select, provide, and require use of PPE that will protect against such hazards; and to train affected employees on the proper uses of PPE.

In addition to the general hazard assessment requirement, OSHA has established specific regulations governing the use of PPE for eyes, face, head, and feet, and spec regulations governing the use of lifesaving (floatation devices) equipment and personal fall arrest systems (“PFAS”). *See id.* § 1915.151. Thus, to the extent that employees at ship breaking facilities are exposed to hazards such as skin absorption of harmful substances, severe cuts or lacerations from cut steel, chemical burns, harmful temperature extremes, and sharp objects, employers must ensure that their employees use equipment that will protect their hands and other exposed body parts. *Id.* § 1915.157.

In addition, shipyard employees who work in an area that will expose them to flying debris, caustic liquids, or liquid chemicals must wear equipment that will protect their face and eyes. *Id.* § 1915.153. Also, employees working in areas where objects may fall and injure their head must wear a protective helmet. *Id.* § 1915.155. Ship breaking employees must wear footwear that will protect them from foot injuries due to falling or rolling objects or objects piercing the sole. *Id.* at § 1915.156.

Finally, and most significantly perhaps, ship breakers must provide their employees who are likely to be exposed to air contaminants (such as lead paint or asbestos) with respirators, and establish a respiratory protection program required under the general industry standards. *See* 29 C.F.R. § 1910.134.

4.2.4 Recordkeeping and Reporting Requirements

Under the OSHAct, employers with 11 or more employees (at any one time in the previous calendar year) must maintain OSHA records. 29 C.F.R. § 1904. Under section 1904, facilities are required to maintain the OSHA Log No. 200 (which is both a log and summary of occupational injuries and illnesses), and the OSHA No. 101 (which provides additional, detailed information on each of the cases recorded in the Log). Employers with more than one establishment are required to maintain separate records for each establishment. The log and summary (OSHA Log No. 200) and the supplementary record (OSHA Log No. 101) must be retained for five years in each establishment following the end of the year to which the records relate. *Id.* § 1904.6

4.3 Enforcement

Similar to the environmental statutes discussed above, the OSHAct provides for both civil and criminal penalties. *See* 29 U.S.C. § 666. Facilities committing willful or repeated violations of the OSHAct, or any standard, may be penalized as much as \$70,000.00 for each violation. ^{62/} *Id.* § 666(a).

^{62/} The OSHAct defines a “willful violation” as a “failure to comply with OSHA’s safety standards done knowingly and

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Serious violations of the Act, or any OSHA standard, may lead to civil penalties of up to \$7,000.00 for each violation. ^{63/} *Id.* § 666(b). The OSHAct also authorizes OSHA to impose criminal penalties when an employer commits a willful violation of any OSHA standard that results in the death of any employee. *Id.* § 666(e). The punishment ranges from a \$10,000.00 fine and/or imprisonment up to six months for the first violation, and up to a \$20,000.00 fine and/or up to one year imprisonment for a repeated violation. Criminal penalties also may be imposed on employers who knowingly make a false statement on a report, plan, or other document filed with OSHA. *Id.* § 666(g).

States play a large role in enforcing OSHA's safety and health standards. Where a state has the authority to administer its own safety and health regulations, federal OSHA officials have little to no enforcement role. Approximately half the states operate approved safety and health enforcement programs. ^{64/} Accordingly, if your operations are in a state with an approved plan, you must make sure you are in compliance with the state program, and any components of the federal program that are not included in the state program.

purposely by an employer who . . . either intentionally disregards the standard or is plainly indifferent to its requirements." Facilities commit "repeated" violations when "if at the time of the alleged repeated violation, there was a Commission final order against the same employer for a substantially similar violation."

^{63/} A serious violation has been interpreted to require that the employer knew or should have known of the dangerous condition.

^{64/} States operating their own safety and health programs include: Alaska, Arizona, California, Hawaii, Indiana, Iowa, Kentucky, Maryland, Michigan, Minnesota, Nevada, New Mexico, North Carolina, Oregon, Puerto Rico, South Carolina, Tennessee, Utah, Vermont, Virgin Islands, Virginia, Washington, and Wyoming.

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5. CONCLUSION

Both the Department of the Navy and MARAD need to find cost effective means to dispose of surplus ships. Ship breaking is a common and useful way to accomplish this goal. Ship breaking may also present a significant potential business opportunity for shipyards that wish to use their existing resources and knowledge of ship construction for this purpose. However, ship breaking requires careful consideration of applicable federal and state environmental and safety and health laws and regulations.

This regulatory overview describes the principal federal statutory and regulatory programs applicable to shipyards that wish to engage in ship breaking activity. This information will help shipyards ensure that potential environmental and safety and health

compliance obligations are met and that such compliance costs are adequately accounted for in bidding on future ship breaking contracts.

This overview may also provide a basis for comparing U.S. and foreign nation environmental laws to ensure that foreign ports competing for the right to scrap U.S. flag ships do so in a manner that is equivalent to U.S. environmental and safety and health requirements.

This overview is not intended to be a comprehensive review of all applicable federal or state environmental and health and safety requirements. Shipyards wishing to engage in ship breaking activities are encouraged to consult counsel for specific advice or information regarding applicable requirements.

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